

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
24 December 2003 (24.12.2003)

PCT

(10) International Publication Number
WO 03/106867 A2

(51) International Patent Classification⁷: **F16H 61/12, 59/68** (74) Agent: RÜGER, BARTHELT & ABEL; Webergasse 3, 73828 Esslingen (DE).

(21) International Application Number: PCT/EP03/06422

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(22) International Filing Date: 18 June 2003 (18.06.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0213937.6 18 June 2002 (18.06.2002) GB

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(71) Applicant (*for all designated States except US*): **EATON CORPORATION** [US/US]; Eaton Center, 1111 Superior Avenue, Cleveland, OH 44114 (US).

Published:

— without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.



WO 03/106867 A2

(54) Title: METHOD OF DETECTING FALSE NEUTRAL IN AN AUTOMATED TRANSMISSION SYSTEM

(57) **Abstract:** A method and system for controlling downshifting in an automated mechanical transmission system (10) utilized on a vehicle. When an automatic power downshift from a currently engaged ratio (GR) is required, the engine acceleration (EA) is monitored and compared with an engine free acceleration (EFA) to detect a false Neutral condition and to take appropriate action accordingly. Alternatively, a false Neutral condition is detected when the Absolute Value of the rotational speed of the output shaft (OS) times the currently engaged gear ratio (GR) minus the rotational speed of the input shaft (IS) is less than a predetermined value (ABS((OS*GR)-IS)).